

CDC & ATSDR

NUMBERING STANDARDS FOR NETWORK-BASED SERVICE PROVIDERS

I. Overview

At the suggestion of IRMO's WAN Planning Team, the IRM Coordinators have approved a plan to have all networks across the CDC WAN be converted to numbers which meet a new standard intended to improve manageability of the WAN. According to the plan, all networks should meet the new standards by February 1, 1993. IRMO has set up a computerized system for assignment of the new network numbers and their maintenance in a database. This document has been created as a "working document" to detail to procedures for obtaining and implementing Network numbers which comply with the new standard. Note that when a network is assigned, both the IP and IPX numbers are assigned, even if both will not be used.

II. IP Addressing

A. General

IP addresses consist of four segments separated by periods, each segment usually expressed as a decimal number between zero and 255, inclusive.

B. First Two Octets (CDC Class B License)

At CDC, the first two segments are always "158.111", the third segment is used to identify a particular logical network, and the fourth segment is used to identify a unique node or "host" within a particular network.

C. Masking

A mask of 255.255.255.128 will be used on all IP networks at CDC. This will allow us 508 logical networks at 126 nodes per net. Using this mask allows us to have two logical networks for each allowable value in the 3rd octet, for instance: network 158.111.11.0 (low range) includes host values 158.111.11.1 thru 158.111.11.126, while network 158.111.11.128 (high range) includes host values 158.111.11.129 thru 158.111.11.254.

D. Third Octet (Nominal Network)

Allowable values in the 3rd segment are one thru 254.

Networks 1 thru 10 will be reserved for global use by IRMO.

Networks 11 thru 30 will be used for campus backbones (see table).

Networks 31 thru 254 will be sequentially assigned for local use by IRMO.

E. Fourth Octet (node or "host" address)

On Campus Backbones:

Host values on campus backbones will be as follows (where cc = 2-digit 3rd octet)

158.111.cc.1 thru 158.111.cc.40 are reserved for use by IRMO

158.111.cc.41 thru 158.111.cc.126 will be assigned by IRMO for use by Servers/Routers

158.111.cc.129 thru 158.111.cc.168 are reserved for use by IRMO

158.111.cc.168 thru 158.111.cc.254 will be assigned by IRMO for use by Servers/Routers

On Local Networks

Host values on "low range" (segment 4 = 1 thru 126) local networks will be as follows:

158.111.nn.1,2: primary, alternate server/routers connecting local net to campus backbone

158.111.nn.3 thru 13: reserved for use by IRMO

158.111.nn.14 thru 126: assigned by LAN Administrator for local use

Host values on "high range" (segment 4 = 129 thru 254) local networks will be as follows:

158.111.nn.129, 130: primary, alternate server/routers connecting local net to campus backbone

158.111.nn.131 thru 141: reserved for use by IRMO

158.111.nn.142 thru 254: assigned by LAN Administrator for local use

III. IPX Addressing

A. Campus Backbones

IPX, as well as IP network numbers for campus backbones are assigned by IRMO. A list of current assignments may be obtained by

E-mailing a request to "CDC WAN Notification" distribution list with the subject "Request for Campus Network Numbers."

B. Local Networks

1. Requesting

Local IP and IPX network numbers are assigned by IRMO. Requests for network numbers should be e-mailed to the "CDC WAN Notification" distribution list with the following subject format: "CIO-DIV req for net(s)," where CIO-DIV are abbreviations for the requesting organization. Requests should be made at least 10 days in advance.

2. Information provided in request

The body of the E-mail should include a contact phone and beeper number along with a list with one item for each network number needed. Each line item should include the following:

The old IPX Network number, or "NEW" if this is to be a new network.

The name of the primary router or server connecting the network to a campus backbone.

The campus on which the network is [to be] located.

Date network is to be created or changed.

3. Assignment

IRMO will respond to network requests by returning a list of IP/IPX network numbers corresponding to the request.

4. Rescheduling Implementation

The "CDC WAN Notification" distribution list should be notified ASAP as to any change of schedule.

5. Unused Network Numbers

The "CDC WAN Notification" distribution list should be notified of any "new standard" network numbers that are no longer needed, so they can be reassigned.

IV. Sample Configuration Statements

file server name ROPS-IRM-BMT

ipx internal net 1C11A042

load tcpip forward=yes

; (internal net is local net preceded by a tie breaker)

.

.

rem bind campus net:

load DRIVERNAME [parameters] frame=token-ring_snap name=IP_11_53

bind IP to IP_11_53 addr=158.111.11.53 mask=255.255.255.128

;addr value assigned by IRMO

load DRIVERNAME [parameters] frame=token-ring name=IPX_C011

bind IPX to IPX_C011 net=C011

rem bind local net:

load DRIVERNAME [parameters] frame=token-ring_snap name=IP_42_1

bind IP to IP_42_1 addr=158.111.42.1 mask=255.255.255.128

;addr value assigned by IRMO

load DRIVERNAME [parameters] frame=token-ring name=IPX_C11A042

bind IPX to IPX_C11A042 net=C11A042

V. Temporary Network Numbers Network Numbers for Test Servers

It is important to distinguish between "Internal IPX (IIPX) Network numbers" and "IPX Network numbers."

IPX Network numbers (or "ring numbers") are assigned by IRMO and specified in the "Bind" statements in an autoexec.ncf file. We speak of servers/routers as being "bound" to these networks. These are seven characters long (excluding leading 0) for local networks and four characters long for campus backbones.

IIPX numbers are specified in the second statement of an autoexec.ncf file ("Internal IPX Network Number 1C11A123"). These are eight characters long, and typically created by preceding a 7-character IPX Network number assigned by IRMO and preceding it with a tiebreaker. The reason for the tiebreaker is that the IIPX number, like the IPX Network number must be unique across the WAN. An IIPX number cannot be the same as an IPX number or as any other IIPX number. We start with a local network number, say C11A123. For the first server binding to that network, create that server's IIPX number by preceding the local net by a one, hence the IIPX number will be 1C11A123. If we bind a second server to that same network, its IIPX number would be 2C11A123.

If all you're doing is setting up a new file server, you don't need a test local network. You can just bring it up on an existing local network or a campus backbone. The internal IPX number for the test server will be assigned in the standard manner: local net to which it's bound preceded by a tiebreaker, or in the case where no local net is bound, campus net (eg. C024) preceded by campus code (eg. C24) preceded by a tiebreaker for that campus (1, 2, 3, etc.). So, the first server taking its IIPX from campus net C024 would be 1C24C024, second would be 2C24C024, etc.

If you need to set up a new local for the server before you take down the old local, i.e., there will be a time during which both locals have workstations attached, request a new network via the "CDC WAN Notification" distribution list. When you're ready to remove the old local from service, report that to "CDC WAN Notification" distribution list so that the old number may be returned to the pool of available network numbers.